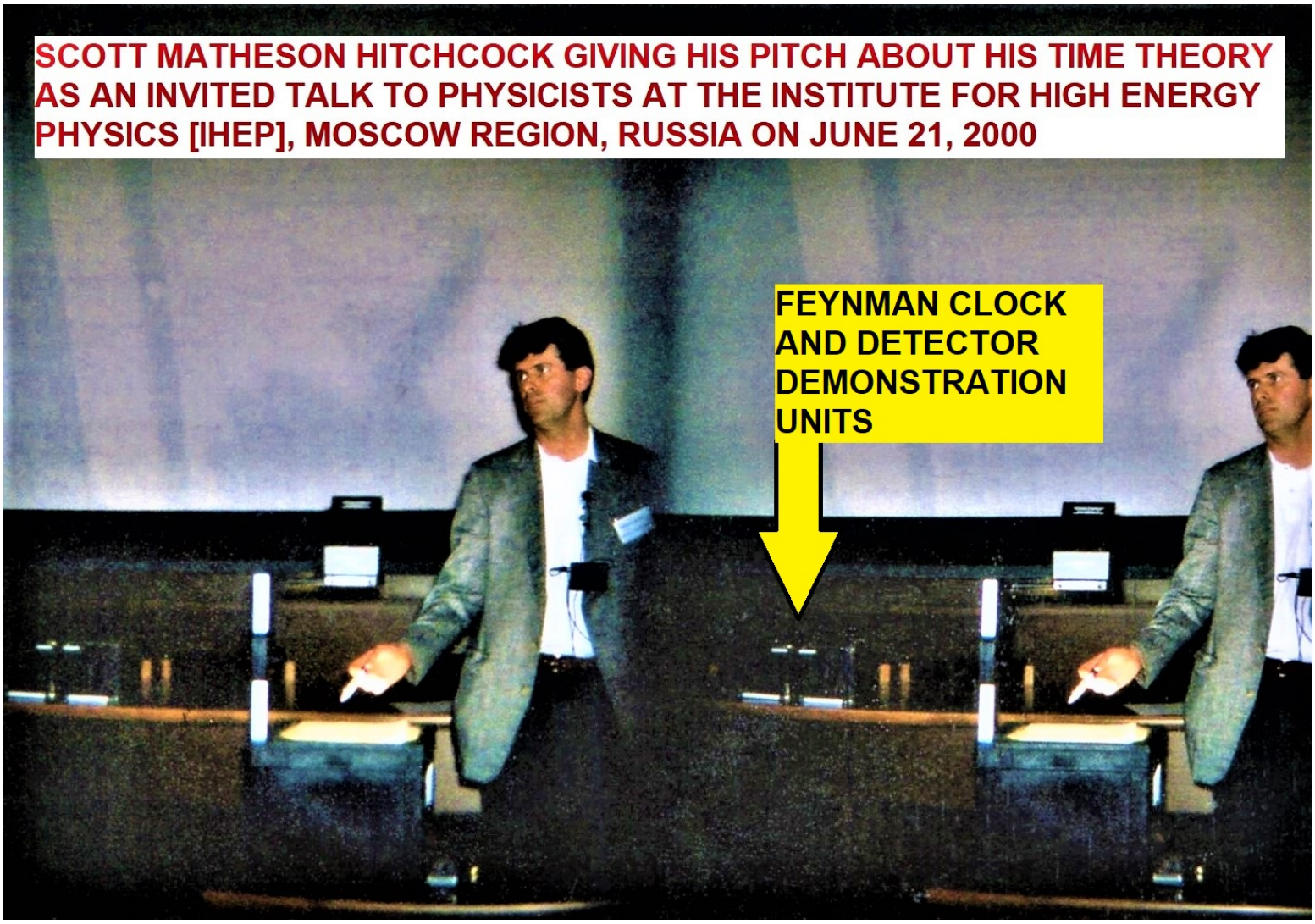

See the talk:

Feynman Clocks, Causal Networks, and the Origin of Hierarchical 'Arrows of Time' in Complex Systems from the Big Bang to the Brain

WITH THE ORIGINAL ILLUSTRATIONS USED IN THE TALK

Scott Matheson Hitchcock

An Invited Special Guest Speaker Presentation Given at **The Institute For High Energy Physics [IHEP]**, *Protvino, Russia.*
Presented: Wednesday, June 21, 2000

A VERY SPECIAL AND WARM THANKS TO VLADIMIR A. PETROV OF IHEP FOR MAKING THIS HISTORIC MOMENT POSSIBLE

Abstract:

A theory of time as the 'information' created in the irreversible decay process of excited or unstable states is proposed. Using new tools such as Feynman Clocks (FCs) Feynman Detectors (FDs), Collective Excitation Networks (CENs), Sequential Excitation Networks (SENs), Plateaus of Complexity (POCs), Causal Networks, and Quantum Computation Methods previously separate 'arrows of time' describing change in complex systems ranging from the Big Bang to the emergence of consciousness in the Brain are 'unified'. The 'direction' and 'dimension' of time are created from clock ordered sets of real number 'labels' coupled to signal induced states in detectors and memory registers. The 'Problem of Time' can

be 'solved' using the fundamental irreversible Quantum Arrow of Time (QAT) and reversible Classical Arrows of Time (CATs) to 'map' information flow in causal networks. A pair of communicating electronic Feynman Clock/Detector units were built and used to demonstrate the basic principles of CAUSAL NETWORKS of Feynman Clock and Detector *NODES* that illustrate how this new theory of 'time' is the product of information flow in complex networks that compose the evolving structures of the universe in and around us as processed with our brains T-computer using our instruments.

THE PAPER ABOVE WAS THE RESULT OF FURTHER INVESTIGATIONS INTO THE IDEAS FIRST ESTABLISHED BY THE FOLLOWING PAPER BELOW:

Quantum Clocks and the Origin of Time in Complex Systems.

This is Scott's first paper [with link] posted on the LANL [now Cornell] e-print arXiv about *time* and while some of the ideas presented were dropped later, others were expanded in subsequent papers. This paper lead to Scott's invitation by Vladimir A. Petrov to come to Russia and give an invited guest speaker talk at The Institute For High Energy Physics [IHEP], Protvino, Russia. Presented: Wednesday, June 21, 2000 which is this web page.

See the following for the follow up 2001 talk:

IHEP 2001 [Russia] An Invited Talk "Time and Information: The Origins of 'Time' from Information Flow In Complex Systems"

SPACE-TIME DIAGRAMS ARE *MAPS* WHERE TIME IS *ASSUMED* TO BE A DIMENSION [LIKE THE 3-DIMENSIONS OF CONVENTIONAL SPACE] LEADING TO THE INCORRECT IDEA THAT TIME IS A FUNDAMENTAL PROPERTY OF THE EVOLVING AND *CHANGING* OBSERVABLE UNIVERSE.

THE FATAL ERROR HERE IS ASSUMING THAT ONE COULD MOVE BACKWARDS 'IN' TIME AS ONE COULD MOVE BACKWARDS IN SPACE.

In other words there is no time dimension [as in space-time maps] to 'reverse' in.

A MAP IS NOT THE TERRITORY – Alfred Korzybski [1931]

NO CHANGE, THEN, NO TIME – J. B. Priestley [1964]

SEE THE FOLLOWING:

T-COMPUTERS AND THE ORIGIN OF TIME IN THE BRAIN

What Time Is And What Time Is Not

TIME MAPS How We Make Maps Of Time

Myths Of Physics Collection

Time and the Myth of T-symmetry: Why T-symmetry is wrong

Grand Unification Theory using Time to unify the fundamental interactions and forces

See other papers covering the topics listed above by this author at:

https://archive.org/details/@scott_matheson_hitchcock368

THE FEYNMAN CLOCK DEMONSTRATION UNITS ARE ILLUSTRATED BELOW

IHEP 2000 [Russia] An Invited Talk "Feynman Clocks And The Origins Of Time In Complex Systems From The Big Bang To The Brain" by Scott Matheson Hitchcock Given at The Institute For High Energy Physics [IHEP] , Protvino, Russia. Presented: Wednesday, June 21, 2000

Feynman Clock Demonstration Units, The units illustrate the status of the excited (green LEDS) and detector states (red LEDs) of two representative FC-nodes or gates in a causal network. Each of the two identical FC/FD units in the kit is a battery operated infra-red photon pulse transmitter and detector. Signals from one unit are sent to the other unit by conventional infrared sources and detectors used in television remote controls. They are shielded from stray light by the two hollow black tubes between the units. The 'time' interval between successive FC signal emissions (accompanied by a decreasing number of green LEDS displayed on the transmitter) represents the lifetime of the collective exctiation state forthat system configuration given by the number of LEDs illuminated. The 'decay', or 'decoherence' lifetimes for the transition from the FD mode to the FC mode of a unit represent the internal reconfiguration process of the entire gate or node. The number of green LEDs displayed indicates hoe many signals or excited states remain in the Feynman Clock mode of that unit from a maximum possible number of 10. After all ten signals have been sent the transmitting unit shifts to a FD mode with no lights on. It remains in this mode until 10 signals have been detected by it or it is shut off. Examples of these systems include the photon emission and absorption in atoms, phonons or sound waves emitted or detected in crystals, and electron and 'exciton' flow in photosynthetic networks in plant cells. The cyclical circuits created with the feedback and feedforward of signals between these two units illustrates elementary information processing in neurons. Conventional 'time' between red/green LED events is created by the observer of the two node network by a process of signal mapping. The red and green light is mapped to the internal or standard clock of the observer from which the understanding of the causal nature of the information flow between these two units is related to the standard 'direction' and 'dimension' associated with 'time'.